



## Complete Summary

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### GUIDELINE TITLE

Life cycle and metabolic conditions.

### BIBLIOGRAPHIC SOURCE(S)

Life cycle and metabolic conditions. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl):45SA-60SA. [205 references]

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Malnutrition and undernutrition (failure to thrive)

### GUIDELINE CATEGORY

Management  
Prevention  
Screening  
Treatment

### CLINICAL SPECIALTY

Family Practice  
Gastroenterology  
Geriatrics  
Internal Medicine  
Nutrition  
Obstetrics and Gynecology  
Pediatrics

## INTENDED USERS

Advanced Practice Nurses  
Dietitians  
Health Care Providers  
Hospitals  
Nurses  
Physician Assistants  
Physicians  
Social Workers

## GUIDELINE OBJECTIVE(S)

- To revise the 1993 American Society for Parenteral and Enteral Nutrition Clinical Guidelines so that:
  - The Guidelines are factually up-to-date to reflect current, evidence-based, best approach to the practice of nutrition support
  - The Guidelines support the clinical and professional activities of nutrition support practitioners by articulating evidence-based recommendations upon which to base personal and institutional practices and resource allocation
  - The Guidelines serve as tools to help guide policy makers, health care organizations, insurers, and nutrition support professionals to improve the systems and regulations under which specialized nutrition support is administered
- To assist clinical practitioners who provide specialized nutrition support to patients in all care settings

## TARGET POPULATION

- Pregnant women
- Premature and/or low birth weight babies
- Infants and children including those with failure to thrive
- Geriatric patients
- Individuals with obesity
- Individuals with diabetes mellitus

## INTERVENTIONS AND PRACTICES CONSIDERED

### Screening/Prevention

1. Nutrition screening for pregnant patients, preterm infants, geriatric patients, obese patients, and patients with diabetes mellitus
2. Assessment with NCHS growth chart for children with failure to thrive

### Evaluation

1. History and physical exam (pediatric undernutrition)
2. Assess potential drug-nutrient interactions (geriatric patients)
3. Assess energy requirements with indirect calorimetry (obese patients)

## Treatment

1. Specialized nutrition support
  - Enteral nutrition (EN)
  - Parenteral nutrition (PN)
2. Special considerations for:
  - Pregnant patients
    - Monitoring of blood glucose levels
    - Intravenous lipid emulsions
    - Folic acid supplementation
  - Pediatric undernutrition (failure to thrive)
    - Multidisciplinary team approach
    - Periodic reevaluation with anthropometric and clinical assessment tools
  - Geriatric patients
    - Individualized diet and SNS prescription
  - Obese patients
    - Hypocaloric nutrition regimens with supplemental protein
  - Patients with diabetes mellitus
    - Glucose controls
    - Individualized macronutrient composition of EN and PN

## Management

1. Ethical and Legal Issues
  - Staff education on benefits and burdens of SNS
  - Living wills and/or advance directives
  - Patient education regarding SNS and right to refuse
  - Institutional policies on withdrawal/withholding of SNS
2. Quality of life
  - Use of health-related quality of life tools

## MAJOR OUTCOMES CONSIDERED

- Nutrition-related outcomes for pregnant women and preterm infants: growth and development of child, prenatal morbidity and mortality
- Prevalence and adverse outcomes associated with pediatric undernutrition
- Effects of aging-related physiologic changes on nutritional requirements
- Prevalence and adverse outcomes associated with obesity
- Quality of life

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

## NUMBER OF SOURCE DOCUMENTS

Not stated

## METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

## RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

A modified version of the method used by the Agency for Healthcare Research and Quality (AHRQ), US Department of Health and Human Services was used:

- A. There is good research-based evidence to support the guideline (prospective, randomized trials).
- B. There is fair research-based evidence to support the guideline (well-designed studies without randomization).
- C. The guideline is based on expert opinion and editorial consensus.

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Experts selected for their detailed knowledge and experience in a chosen niche reviewed the primary literature, synthesized and summarized it, and formulated the guideline statements.

In situations where evidence-based recommendations could not be made because of a lack of relevant clinical studies, recommendations are classified as being based on class C data (see the "Rating Scheme for the Strength of Evidence" field) and reflect an attempt to make the best recommendations possible within the context of the available data and expert clinical experience.

## Issues Considered During Recommendation Formulation

- A thread running throughout many of the disease-specific guidelines is the rationale for choosing enteral over parenteral specialized nutrition support

(SNS) or alternatively parenteral over enteral when a decision to use SNS has been made.

- Another fundamental issue that influenced many of the discussions and recommendations is the relationship between nutrition assessment, nutrition status, malnutrition, and severity of disease.

Refer to the companion document: Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients. Section I: Introduction. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl): 1SA-6SA.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

## COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

## METHOD OF GUIDELINE VALIDATION

External Peer Review  
Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Completed drafts were reviewed by the section editors (the members of the Clinical Guidelines Task Force [CGTF]), edited and/or rewritten, and then reviewed twice by the members of the CGTF as a group. The entire document was then reedited by the CGTF Chair. This four-times-edited draft was submitted to the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors and more than 180 experts in the field of nutrition support (including experts and organizations outside of A.S.P.E.N.) for content, format, and style review. These reviewers were also specifically asked to check each guideline statement for appropriateness, accuracy, and strength of evidence. This review phase stimulated a final cycle of editing by the CGTF and the CGTF Chair. The final document was then approved by the A.S.P.E.N. Board of Directors and submitted to the Journal of Parenteral and Enteral Nutrition for publication.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

The strength of the evidence supporting each guideline statement is coded A, B, or C. Definitions of these classifications is provided at the end of the "Major Recommendations" field.

Pregnancy

1. Pregnant women are at nutrition risk and should undergo nutrition screening to identify those who require formal nutrition assessment with development of a nutrition care plan. (B)
2. In pregnant women who require Specialized Nutrition Support (SNS), baseline needs should be supplemented with an additional 300 kcal/d and 10 to 14 g/d of protein during the second and third trimester. (B)
3. Parenteral nutrition (PN) is indicated for pregnant patients at risk for malnutrition because of a nonfunctioning gastrointestinal tract or inability to tolerate enteral nutrition (EN). (C)
4. Maternal blood glucose should be maintained within the range of 90 to 120 mg/dL. (C)
5. Intravenous lipid emulsions may be used safely in pregnant women to provide a source of isotonic nonprotein calories and avoid essential fatty acid deficiency. (C)
6. All women of child-bearing age who are capable of becoming pregnant should consume at least 0.4 mg/d of folic acid, using specific supplementation if necessary. (A)

#### Neonatology - Premature Infant

1. Preterm infants are at nutrition risk and should undergo nutrition screening to identify those who require formal nutrition assessment with development of a nutrition care plan. (B)
2. When indicated, PN should be started in preterm infants on day 1 of life, if clinically possible. (B)
3. Concurrent EN in infants receiving PN should be started as soon as clinically possible. (C)
4. Protein should be given to stable extremely low birth weight (ELBW) and very low birth weight (VLBW) infants at a rate of 3.5 to 3.85 g/kg per day. (B)
5. Energy should be administered at a rate of 100 to 120 kcal/kg per day to stable preterm infants anabolism. (A)
6. Intravenous glucose administration should be advanced as tolerated to 10 to 13 mg/kg per minute to meet caloric goals. (A)
7. Intravenous fat emulsion should be administered over 24 hours up to a maximum rate of 3 g/kg per day. (B)

#### Neonatology – Pediatric Undernutrition (Failure to Thrive)

1. Clinicians should define pediatric undernutrition as either: weight for age or weight for height less than the third percentile (less than -2.0 weight for age or weight for height Z-score) on the 2000 National Center for Health Statistics (NCHS) growth charts or a fall across two or more centile lines on the National Center for Health Statistics growth charts, once a stable growth pattern has been reached. (B)
2. Severity of wasting and stunting should be assessed (Z score less than -2.0 [moderate], less than -3.0 [severe]) and past or continuing causes of growth delay documented. (B)
3. A careful history and physical exam should be performed to assess risk factors for undernutrition and to evaluate resources available to treat undernutrition. (C)

4. A multidisciplinary team approach, including a dietitian, social worker, nurse, behavior specialist, and physician, should be convened to diagnose, treat, and monitor undernourished patients. (B)
5. Periodic reevaluation of nutrition status should be performed using anthropometric and clinical examination assessment tools. (B)

### Geriatrics

1. Elderly patients (age greater than 65 years) are at nutrition risk and should undergo nutrition screening to identify those who require formal nutrition assessment with development of a nutrition care plan. (B)
2. Age and life style parameters should be used to assess the nutrition status of elderly persons. (C)
3. Potential drug-nutrient interactions should be assessed in all elderly patients receiving medications. (B)
4. Diet and SNS prescriptions for elderly persons should take into consideration altered nutrient requirements observed in this age group. (B)

### Obesity

1. Obese patients are at nutrition risk, and should undergo nutrition screening to identify those who require formal nutrition assessment with development of a nutrition care plan. (B)
2. When possible, energy requirements of obese patients should be assessed using indirect calorimetry because predictive equations have considerable limitations in estimating energy requirements in obese patients. (B)
3. Hypocaloric nutrition regimens with supplemental protein are recommended in the treatment of mild to moderately stressed obese patients. (A)

### Diabetes Mellitus

1. Patients with diabetes mellitus are at nutrition risk and should undergo nutrition screening to identify those who require formal nutrition assessment with development of a nutrition care plan. (A)
2. In ambulatory, otherwise healthy people with diabetes mellitus, strict glucose control is recommended to decrease the incidence of diabetes-related complications. (A)
3. Blood glucose levels should be maintained in the 100 to 200 mg/dL range in hospitalized patients with diabetes mellitus. (A)
4. The macronutrient composition of EN and PN provided to patients with DM should be individualized and avoid administration of excess calories (B)

### Ethical and Legal Issues

1. Legally and ethically, SNS should be considered a medical therapy. (A)
2. Care providers should be familiar with current evidence of the benefits and burdens of SNS. (C)
3. Patients should be encouraged to have living wills and/or advance directives and to discuss with their loved ones their wishes in the event of a serious or terminal accident or disease. (C)
4. Adult patients or their legally authorized surrogates have the right to accept or to refuse SNS. (A)

5. The benefits and burdens of SNS, and the interventions required to deliver it, should be considered before offering this therapy. (B)
6. Institutions should develop clear policies regarding the withdrawal or withholding of SNS and communicate these policies to patients in accordance with the Patient Self-Determination Act. (A)

#### Quality of Life

1. The subjective patient experience receiving SNS should be measured with an HRQOL tool. (B)
2. A nutrition support HRQOL tool should include generic and disease targeted measures for either cross-section and/or longitudinal observations. (C)

#### Definitions:

#### Rating Scheme

- A. There is good research-based evidence to support the guideline (prospective, randomized trials).
- B. There is fair research-based evidence to support the guideline (well-designed studies without randomization).
- C. The guideline is based on expert opinion and editorial consensus.

#### CLINICAL ALGORITHM(S)

Clinical algorithms of the Nutrition Care Process and Route of Administration of Specialized Nutrition Support are provided in the companion document: Nutrition care process. Section II: Nutrition Care Process. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl): 7SA-8SA.

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not explicitly stated.

### BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

#### POTENTIAL BENEFITS

Appropriate selection and use of specialized nutrition support in persons at various life cycles and with certain metabolic conditions.

#### Pregnancy

The correlation between maternal nutrition and healthy babies has been well established. Adequate nutrition before and during pregnancy is necessary to achieve optimal health of the pregnant mother and her baby. Maternal malnutrition can have a profound effect on the growth and development of the unborn child and lead to poor pregnancy outcomes, including low-birth-weight



infants, intrauterine growth retardation, and increased prenatal morbidity and mortality. Women with a low pre-pregnancy weight-for-height are at greatest risk for giving birth to a low-birth-weight infant when maternal weight gain is inadequate.

#### Neonatology: Premature Infants

Parenteral nutrition (PN), incorporating protein, carbohydrate and fat infusion, should be started as soon as clinically possible, preferably on the first day of life, to prevent a starvation state, normalize serum glucose levels, and improve protein balance. Nutrient delivery is provided in quantities to promote growth matching in utero accretion rates.

#### Neonatology: Pediatric Undernutrition

Most children treated for undernutrition gain weight and grow well. A multidisciplinary approach to evaluation and treatment of children with undernutrition has been associated with faster weight gain than treatment in the primary care setting alone.

#### Diabetes mellitus (DM)

Appropriate nutrition therapy is a vital component in the treatment of DM. Timely nutrition assessment and initiation of medical nutrition therapy may help to prevent the development of complications over the long run.

#### Subgroups Most Likely to Benefit

Risk factors for developing undernutrition in the United States include low birth weight and chronic diseases of infancy as well as complex social factors including poverty, parental stress, parental health beliefs, excess fruit juice consumption, and parent-child interaction difficulties. Oral-motor dysfunction and poor feeding skills may also play a role in the development of undernutrition.

### POTENTIAL HARMS

#### Premature Infants

In very low birth weight/extremely low birth weight infants on parenteral plus enteral nutrition, the risk of necrotizing enterocolitis in this population can be minimized by avoiding rapid advancement of the feeding regimen.

#### Diabetes Mellitus

Because intensive insulin therapy may increase the risk for hypoglycemia, it is important to closely monitor blood glucose levels when providing specialized nutrition support (SNS) to individuals with diabetes mellitus.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

These American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Clinical Guidelines are general statements. They are based upon general conclusions of health professionals who, in developing such guidelines, have balanced potential benefits to be derived from a particular mode of medical therapy against certain risks inherent with such therapy. However, the professional judgment of the attending health professional is the primary component of quality medical care. The underlying judgment regarding the propriety of any specific procedure must be made by the attending health professional in light of all of the circumstances presented by the individual patient and the needs and resources particular to the locality. These guidelines are not a substitute for the exercise of such judgment by the health professional, but rather are a tool to be used by the health professional in the exercise of such judgment. These guidelines are voluntary and should not be deemed inclusive of all proper methods of care, or exclusive of methods of care reasonably directed toward obtaining the same results.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

End of Life Care  
Getting Better  
Living with Illness  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Life cycle and metabolic conditions. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl):45SA-60SA. [205 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 Jan-Feb

GUIDELINE DEVELOPER(S)

American Society for Parenteral and Enteral Nutrition - Professional Association

SOURCE(S) OF FUNDING

Not stated

GUIDELINE COMMITTEE

Clinical Guidelines Task Force

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 741-8972. For details, please see the [ASPEN Web site](#).

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl): 1SA-6SA.
- Nutrition care process. JPEN J Parenter Enteral Nutr 2002 Jan-Feb;26(1 Suppl): 7SA-8SA.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 741-8972. For details, please see the [ASPEN Web site](#).

#### PATIENT RESOURCES

None available

#### NGC STATUS

This summary was completed by ECRI on May 5, 2004.

#### COPYRIGHT STATEMENT

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